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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,667	01/22/2002	Norihisa Mino	10873.876US01	8002

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EXAMINER	
BERNATZ, KEVIN M	
ART UNIT	**PAPER NUMBER**
1773	

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/055,667	MINO ET AL.	
	Examiner	Art Unit	
	Kevin M. Bernatz	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,39 and 40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,39 and 40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Amendments to claims 1, 39 and 40, and cancellation of claims 36 - 38, filed on April 28, 2005, have been entered in the above-identified application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Examiner's Comments

3. Applicants are reminded that regarding the limitation(s) in claims 1 – 12, 39 and 40, the Examiner has given the claimed limitations the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994). See MPEP 2111. Specifically, the Examiner notes that applicants are claiming a first molecular organic coating film (1st MOC) and a second molecular organic coating film (2nd MOC), wherein each of the 1st and 2nd MOC have (essentially) functional groups on their ends. Applicants then claim that these two MOC are bonded together ("a chemical bond is formed between the second functional group and the fourth functional group"). The *chemistry and structure* of the functional groups are not claimed, other than the fact that the "fourth functional group is different from the second functional group". Furthermore,

what is meant by the term "functional group" is not defined in applicants' specification, nor in the claims (i.e. any element can read on "functional group", from a simple hydrogen atom (H) to reactive polar structures, such as phenols, benzyl rings, etc.).

As such, since the claims are directed to a *product* and not a method of making, one must look at the form that the final product would possess. In the instant case, given that the 2nd and 4th functional groups are bonded together, hence bonding the 1st and 2nd MOC's together, applicants' final product is essentially indistinguishable from a structure possessing a *single* MOC with 2 functional groups on each end, provided it has at least 2 atoms arranged somewhere in the middle of the MOC that are adjacent to each other (i.e. a "chemical bond") and are different from each other. FREX, any group with a single ether (-C-O-C-) linkage would meet the claimed limitation by producing a final product which would appear substantially identical in structure to the claimed product. For further understanding of the Examiner's position/concern, consider applicants Figure 3A. The final product (and claimed product) is the particle bonded by the organic molecule represented by the rightmost linkage (the one with the label "5" on the chemical bond). However, glancing at Figure 3A it is impossible to distinguish between the following two cases:

I. As disclosed by applicants, a 1st and 2nd MOC separately deposited on the particle and the substrate, then reacted; versus

II. A coating of –O-(SiO_2)-(C_2H_4)-benzyl-CH_2-benzyl-CH_2-(SiO_2)-O- deposited on the substrate and then reacted with the particle and/or

adjacent linking molecules (though the Examiner notes that the linkage between adjacent molecules is *not* claimed!)

As such, the Examiner is forced to consider the claim language regarding the 2nd and 4th functional groups as a process limitation in a product claim, since upon being chemically bound to each other, there no longer exists a 1st and 2nd MOC, but rather a single MOC composed of the remnants of the 1st and 2nd MOC's.

Regarding process limitations in a product claim, the Examiner notes that these limitations are not necessarily further limiting in terms of the structure resulting from the claimed process. Specifically, in a product claim, as long as the prior art product meets the claimed structural limitations, the method by which the product is formed is not germane to the determination of patentability of the product unless an unobvious difference can be shown to result from the claimed process limitations. In the instant case, the *structure* resulting from the claimed process requires that at some point in the final molecular structure, two internal, adjacent "functional groups" must be different from each other.

The Examiner further notes that the above noted concern can be addressed by applicants in many ways, not the least of which are the following. First, applicants can provide evidence showing that the "process" results in an unobvious difference in structure/properties of the final product (i.e. unexpectedly improved adhesion, etc). Applicants would be encouraged to positively claim the product in a "product-by-process" format, should applicants desire to pursue this approach. Second, applicants can provide additional structure in terms of what is meant by "functional group",

specifically what is encompassed by the "second" and "fourth" functional groups, which would serve to better distinguish the actual final product from other molecular chains. Finally, applicants should consider pursuing claims directed to the process of binding a particle to the surface, since the method of utilizing a separate 1st and 2nd MOC would serve to distinguish over methods utilizing only a single molecule to bind particles to the surface of a substrate. The Examiner notes that such a change in scope would require the filing of a divisional application, since the Office does not generally permit a shift in the invention once applicants have received an action on the merits of the invention.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 – 3, 5 – 12, 39 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "fine" in claims 1 – 3, 5 – 12, 39 and 40 is a relative term which renders the claims indefinite. The term "fine" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The Examiner notes that the word "fine" implies *small* particles, yet applicants have only limited the lower end point of what size applicants' consider are "fine". I.e. is a 55 nm diameter particle "fine"? Or a 100 nm diameter? Etc. Applicants' as-filed disclosure does not

provide sufficient guidance as to the definition of the word *fine*, only giving preferred particle sizes (0.5 nm to 50 nm). Amendment to either remove the word "fine" from the claims, or to insert an upper range (e.g. 50 nm) would be sufficient to overcome this rejection.

Claim Rejections - 35 USC § 102

6. Claims 1, 2, 4 – 7 and 9 – 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Black et al. (U.S. Patent App. No. 2002/0022111 A1) for the reasons of record as set forth in Paragraph No. 9 of the Office Action mailed on October 26, 2004.

Claim Rejections - 35 USC § 103

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Black et al. ('111 A) as applied above, and further in view of Black et al. (U.S. Patent No. 6,162,532) for the reasons of record as set forth in Paragraph No. 11 of the Office Action mailed on October 26, 2004.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Black et al. ('111 A) as applied above, for the reasons of record as set forth in Paragraph No. 12 of the Office Action mailed on October 26, 2004.

9. Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heath et al. (U.S. Patent No. 6,159,620) in view of Black et al. ('111 A) for the

reasons of record as set forth in Paragraph No. 15 of the Office Action mailed on October 26, 2004.

Response to Arguments

10. The rejection of claims 1 – 6 and 9 - 12 under 35 U.S.C § 102(b) and/or 103(a) – Bulkowski et al., alone or in view of Heath et al.

The above noted rejection has been withdrawn in view of applicant(s) arguments, which have been found persuasive. Specifically, applicant(s) argue that the "particle" of Bulkowski et al. is not the element "B" in "Figure I" on page 5 of the Office Action mailed October 26, 2004, as alleged by the Examiner, but the element "D". The Examiner agrees with applicants. However, the Examiner notes that Bulkowski et al. may still read on the claimed invention given the Examiner's comments above. The Examiner has not presently re-applied Bulkowski et al. since the Examiner deems that the Black et al. references are the closest prior art, and any amendments/arguments to overcome the Black et al. references are expected to distinguish over the Bulkowski et al. reference.

11. The rejection of claims 1 – 12 under 35 U.S.C § 102(e) and/or 103(a) – Black et al. ('111 A1), alone or in view of Black et al. ('532)

12. The rejection of claims 39 and 40 under U.S.C § 103(a) – Heath et al. in view of Black et al. ('111 A1)

Applicant(s) argue(s) that "Black '111 fails to disclose or suggest the second molecular organic film" and that "Black '111 fails to disclose or suggest the second and fourth functional groups of claim 1" (*page 7 of response*). The examiner respectfully disagrees.

First, the Examiner notes the "Examiner Comments" recited above, in that technically the disclosed structure does not require two separate molecular films, since the final product has the two molecular films bonded together. However, that position notwithstanding, the Examiner notes that applicants have mischaracterized Black et al. ('111 A1). Specifically, Black et al. ('111 A1) teach coated particles that are then bound to the substrate (*"the formation of covalent links between the organic coat **6** of each ferromagnetic particle **3** and the substrate **1**" – Paragraph 0107*). Black et al. ('111 A1) further teach that the substrate is preferably coated with an affinity coating (*"Specifically, the covalent links **7** are formed between an affinity coating which may preferably been pre-applied on the substrate **1** (bi-functional molecules with 2 distinct ends as described above in reference to **FIG. 5**) and the particles **3**"*). The Examiner notes that applicants confusion may arise from the fact that Black et al. does not explicitly state that the affinity coating is bonded with the organic coat of the particles in the above Paragraph. However, the Examiner deems that there is sufficient specificity that Black et al. ('111 A1) is clearly reciting that the organic coat of the particles are bonded to the organic/affinity coating on the substrate ("*the formation of covalent links between the organic coat **6** of each ferromagnetic particle **3** and the substrate **1***" and "*Specifically, the covalent links **7** are formed between an affinity coating which may preferably been*

pre-applied on the substrate 1"). As such, the Examiner deems there is clear teaching in Black et al. ('111 A1) to precoat both the particles and the substrate, followed by reacting the two coatings together to bond the particles to the substrate. The Examiner notes that the 2nd and 4th functional groups are taught to be different in Paragraphs 0030 – 0063; 0078, 0080 – 0094, 0105, and 0107.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Examiner notes that there is a plethora of prior art which teach substantially an identical method of binding particles to a surface of a substrate as disclosed by applicants (i.e. applying an organic coat to both the substrate and the particles separately, followed by bonding the two coats together). In addition, there is even more art which teach binding particles to a substrate by using a single coating applied to either the substrate or particles, which would still read on the claimed limitations (see Examiner's Comments above). The most pertinent of the prior art are the following:

"102-type" art teaching functionalize particles bound to a functionalized substrate: Yang et al. (U.S. Patent No. 6,420,068 B1) (*Figures and col. 5, lines 5 – 20*), Kambe et al. (U.S. Patent No. 6,881,490 B2) (*Figures; col. 4, line 64 bridging col. 6, line 34; col. 7, lines 8 – 13; col. 13, lines 55 – 62; and col. 23, line 52 bridging col. 24, line 8*), Li et al. (U.S. Patent No. 6,132,764) (*Figure 1 and col. 6, line 64 bridging col. 8, line 67*), Natan

('907) (*Figure 1C and relevant disclosure thereto*), JP '620 A (*Figures and Abstract*), and JP '153 A (*Figures and Abstract*).

Tomihisa et al. (U.S. Patent No. 5,683,501) teach a wide range of functional groups used in particle/substrate adhesion (*col. 18, lines 6 – 54*).

Lesniak et al. (WO 97/38058 – see U.S. Patent No. 6,183,658) teach functionalized particles with a biopolymer for use in MO and magnetic applications (*col. 6, line 40 bridging col. 7, line 7 and claims*). The Examiner notes that Lesniak et al. in view of Natan ('907) directly relates the bio-modified particles of Natan ('907) to recording media applications.

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
July 18, 2005

Kevin M. Bernatz, PhD
Primary Examiner